SNOW SURVEYS AND IRRIGATION WATER FORECASTS

FOR OREGON

AS OF

APRIL 1, 1938

* * *

Issued April 13, 1938
Medford, Oregon

* * * * *

The following data pertaining to snow surveys and irrigation water-supply forecasts are provided by the Bureau of Agricultural Engineering of the U.S. Department of Agriculture, in cooperation with the Oregon State Engineer, Oregon Experiment Station and other Federal, State and local organizations. 1/

* * * * * * *

1/ The snow measurements are made principally by field personnel of the following organizations:

STATE

Oregon State Engineer & Corps of State Watermasters
Oregon Agricultural Experiment Station
Oregon State Highway Engineers
Idaho Cooperative Snow Surveys
Nevada Cooperative Snow Surveys

FEDERAL

Department of Agriculture
  Bureau of Agricultural Engineering
  Forest Service
  Weather Bureau
  Biological Survey
Department of Interior
  Geological Survey
  Bureau of Reclamation
  Indian Service
  National Park Service

PUBLIC UTILITIES

The California Oregon Power Company
Eastern Oregon Light & Power Company
Portland General Electric Company

MUNICIPALITIES

City of The Dalles

MUNICIPAL DISTRICTS

Deschutes County Municipal Improvement District
Medford & Talent Irrigation Districts
Warmsprings Irrigation District
Ochoco Irrigation District

STATUS OF RESERVOIR STORAGE AS OF APRIL FIRST

In the following tabulation, water storage in acre feet as of about April 1, 1938 in some selected Oregon reservoirs is compared with storage as of the same time in 1937.

Storage Reservoir	Stream Basin	Capacity Acre Ft.	In storage Acre Feet About 4-1-38	About 4-1-37
Agency Valley	Malheur	60,000	49,690	30,000
Antelope	Owyhee	33,434	22,620	6,070
Crane Prairie	Deschutes	55,220**	Full	40,240
Crescent Lake	Deschutes	80,000	35,190	27,430
Drew Creek	Goose Lake	62,500	48,830	39,400
Emigrant Gap	Rogue	8,200	8,155	6,400
Fish Lake	Rogue	7,720	4,683	4,992
Four Mile Lake	Klamath *	14,000	11,767	8,746
Gerber	Klamath	94,000	36,920***	44,390
Hyatt Prairie	Klamath *	16,000	8,607	4,700
McKay	Umatilla	75,000	49,840	25,900
Ochoco	Crooked	47,500	27,950	3,440
Owyhee	Owyhee	715,000	646,000	682,860
Thief Valley	Powder	17,400	17,400	17,400
Wallowa Lake	Wallowa	40,920	16,490	7,810
Warm Springs	Malheur	170,000	89,250	46,500
Willow Creek	Malheur	26,000	1,500	Dry

* By ditch to Rogue River side.
** 40,500 by agreement.
*** 28,000 acre feet released during February and March to prepare for spring inflow.

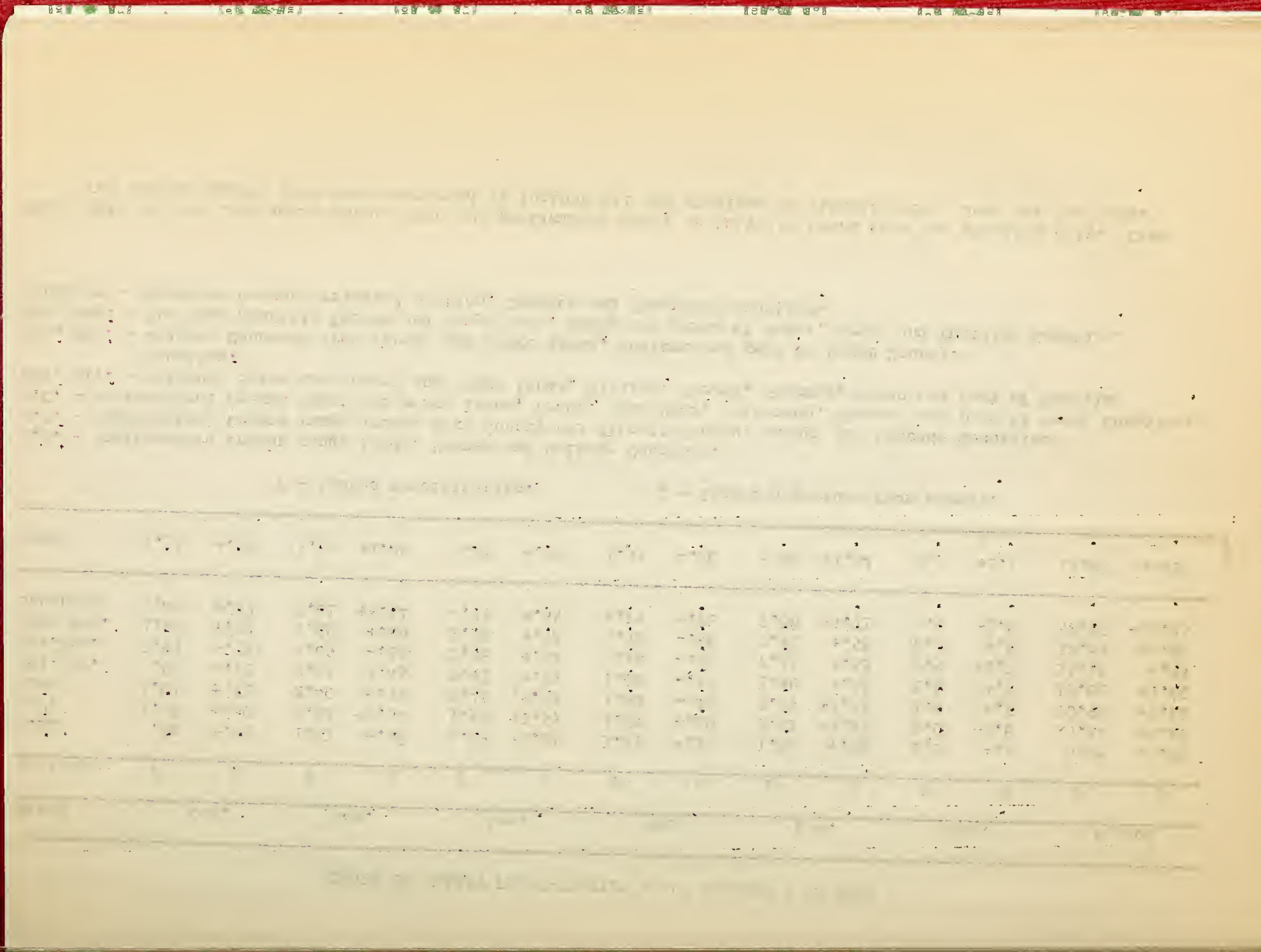
STATUS OF VALLEY PRECIPITATION AS OF OCTOBER 1 TO DATE

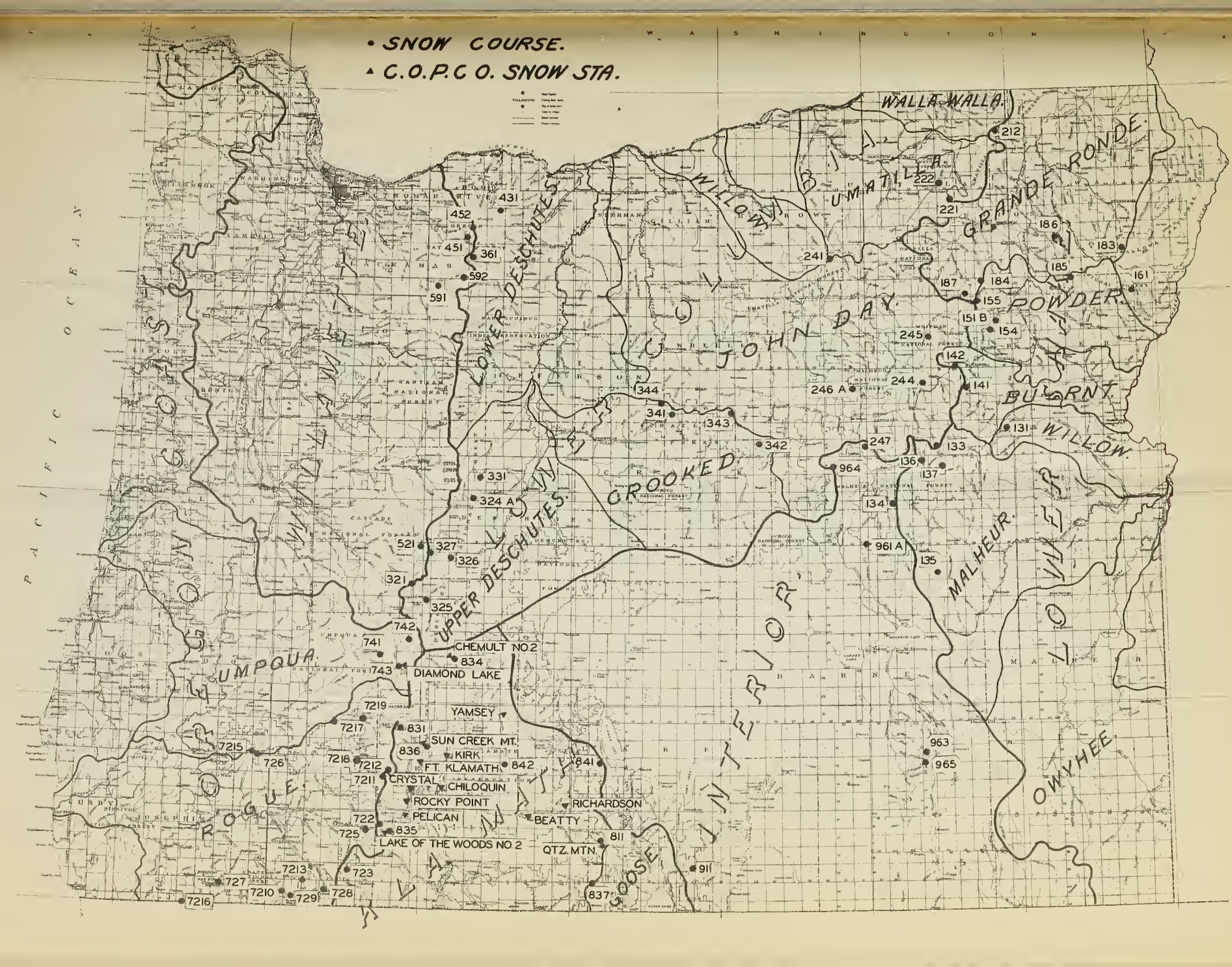
Month	Oct.		Nov.		Dec.		Jan.		Feb.		Mar.		Period	
Section	P	D	P	D	P	D	P	D	P	D	P	D	P	D
S.E.	.82	+.22	1.81	+.98	1.89	+1.03	1.25	+.17	1.32	+.54	1.0	+.3	8.09	+3.24
S.C.	1.48	+.60	2.96	+1.04	3.55	+1.59	1.84	-.10	2.81	+1.23	3.0	+1.8	15.64	+6.16
N.C.	1.04	+.21	2.40	+.76	2.41	+.73	1.30	-.48	2.39	+1.39	1.4	+.5	10.94	+3.11
Col.Riv.	.82	-.12	2.23	+.45	2.41	+.79	1.06	-.58	1.90	+.56	1.6	+.5	10.02	+1.60
Wal.Mts.	1.97	-.73	3.09	-.14	2.96	+.44	2.16	-.32	2.44	+.38	2.5	+1.1	15.12	+.73
Blue Mts.	1.62	+.22	2.60	+.69	2.26	+.34	1.72	-.38	2.32	+.55	2.3	+.6	12.82	+2.02
Southern	3.06	+.87	7.61	+3.54	4.71	+.55	4.19	+.26	7.88	+4.71	5.5	+2.8	32.95	+12.73
Area	1.54	+.18	3.24	+1.05	2.88	+.78	1.93	-.20	3.00	+1.34	2.5	+1.1	15.08	+4.23

P - Inches precipitation. D - Inches departure from normal.

S.E. - Southeastern Oregon range lands, Harney and Malheur Counties.
S.C. - Southcentral Oregon range lands, Lake County and Klamath County, except the Cascade Mountains.
N.C. - Northcentral Oregon wheat and range lands, Crook, Deschutes, Jefferson, Wheeler and part of Grant Counties.
Col. Riv. - Columbia River area wheat and range lands, Gilliam, Morrow, Sherman, Wasco and part of Umatilla Counties.
Wal. Mts. - Wallowa Mountain area forest and range lands, Wallowa and part of Baker County.
Blue Mts. - The Blue Mountain Forest and range area, Union and parts of Baker, Grant and Umatilla Counties.
Southern - Southern Oregon irrigated section, Jackson and Josephine Counties.

Note: Data for the last month shown above are preliminary only, as they are based on a few stations only. Data for earlier months have been corrected to include all the stations in climatological data for the area.




• SNOW COURSE.
▲ C.O.P.C O. SNOW STA.
WASHINGTON
PACIFIC OCEAN
WALLA WALLA.
GRANDE RONDE.
UMATILLA.
WILLOW.
JOHN DAY.
POWDER.
BURNT.
WILLOW.
MALHEUR.
OWYHEE.
DESCHUTES.
LOWER DESCHUTES.
CROOKED.
UPPER DESCHUTES.
UMPQUA.
ROGUE.
KLAMATH.
LAKE.
GOOSE
INTERIOR.
CHEMULT NO.2
DIAMOND LAKE
YAMSEY
SUN CREEK MT.
KIRK
FT. KLAMATH
CRYSTAL
CHILOQUIN
ROCKY POINT
PELICAN
LAKE OF THE WOODS NO.2
RICHARDSON
BEATTY
QTZ. MTN.
431
452
451
361
592
591
212
222
221
241
186
183
185
187
184
155
161
151 B
154
245
142
244
246 A
141
344
341
343
342
247
964
136
137
133
131
134
961 A
135
963
965
331
324 A
521
327
326
321
325
742
741
743
834
7219
7217
831
836
7215
726
7218
7212
842
841
7211
722
725
835
811
723
911
7213
727
7210
729
728
7216
837

TRIBUTARY BASINS (Primary & Secondary & Snow courses)	Oregon Number	LOCATION Sec.	Twp.	Range	Elev.	SNOW COVER MEASUREMENTS About April 1, 1938 Date	Avg. Snow Depth (In.)	Avg. Water Depth (In.)	AVERAGE WATER DEPTH (IN.) One Month ago (3-1-38)	One Year ago (4-1-37)	Two Years ago (4-1-36)
UPPER COLUMBIA DRAINAGE											
LOWER SNAKE IN OREGON											
OWYHEE RIVER											
Big Bend	Nev.	30	45N	56E	6800	4-1	38.2	11.4	8.2	10.5	19.2
Silver City	Idaho	6	5S	3W	6400	3-31	49.4	26.6	7.1	21.9	32.3
South Mountain	Idaho	19	9S	5W	5100	3-31	4.9	1.8	0.9	6.3	2.0
Upper Buckskin	Nev.	14	45N	39E	8200	4-1	44.1	17.5	7.2	6.8	12.5
MALHEUR RIVER											
Blue Mountain Spring	133	21	15S	35E	5900	3-29	54.3	23.4	19.0	16.1	18.2
Rock Spring	134	23	18S	32E	5100	3-31	18.0	8.9	5.5	3.9	9.1
Stinking Water	135	6	21S	37E	4800	3-31	3.7	1.2	3.0	-	-
Lake Creek	136	10	16S	33E	5120	4-1	38.3	14.3	10.8	-	-
Crane Prairie	137	24	16S	34E	5375	3-31	30.8	11.5	8.1	-	-
BURNT RIVER											
Blue Mountain Summit	141	6	12S	36E	5098	3-30	25.0	8.9	6.7	6.1	9.6
Tipton	142	34	10S	35½E	5100	3-26	29.1	9.9	8.0	-	-
POWDER RIVER											
Anthony Lake	155	18	7S	37E	7125	3-28	78.5	25.0	-	27.9	24.9
Bourne	154	33	8S	37E	5800	3-30	48.7	17.1	14.1	10.5	18.3
Eilertson Meadows	151B	18	8S	38E	5400	3-29	35.2	15.7	11.5	-	-
Taylor Green	185	4	6S	42E	5740	3-30	49.8	15.8	-	-	-

TRIBUTARY BASINS (Primary & Secondary & Snow Courses)	Oregon Number	LOCATION Sec.	Twp.	Range	Elev.	SNOW COVER MEASUREMENTS About April 1, 1938 Date	Avg. Snow Depth (In.)	Avg. Water Depth (In.)	AVERAGE WATER DEPTH (IN.) One Month ago (3-1-38)	One Year ago (4-1-37)	Two Years ago (4-1-36)
PINE CREEK											
Schneider Meadows	161	35	6S	45E	5400	3-30	106.3	40.6	-	-	-
GRANDE RONDE RIVER											
Aneroid Lake	183	16	4S	45E	6500	3-27	144.2	47.3	-	27.9	32.5
Camp Carson	187	33	6S	36E	5970	3-29	33.6	10.2	-	-	-
Moss Spring	186	27	3S	41E	5860	4-8	72.6	29.3	19.6	-	-
Summit Springs	184	9	6S	37E	6000	3-30	71.1	22.9	-	25.7	24.0
Taylor Green	185	4	6S	42E	5740	3-30	49.8	15.8	-	-	-
LOWER COLUMBIA DRAINAGE											
WALLA WALLA RIVER											
Toll Gate	212	33	4N	38E	6300	3-26	62.8	23.0	-	25.9	41.1
UMATILLA RIVER											
Emigrant Springs	222	29	1N	35E	4600	3-29	13.0	3.8	5.2	7.9	9.6
Near Meacham	221	24	1S	35E	4600	3-29	25.6	8.2	6.7	12.8	13.3
WILLOW CREEK											
Arbuckle Mountain	241	33	4S	29E	5400	3-31	34.4	13.0	-	18.7	14.7
JOHN DAY RIVER											
Arbuckle Mountain	241	33	4S	29E	5400	3-31	34.4	13.0	-	18.7	14.7
Beech Creek Summit	246A	4	12S	30E	4912	3-30	18.6	7.3	6.9	8.4	2.3
Blue Mountain Spring	133	21	15S	35E	5900	3-29	54.3	23.4	19.0	16.1	18.2

TRIBUTARY BASINS (Primary & Secondary & Snow Courses)	Oregon Number	LOCATION Sec.	Twp.	Range	Elev.	SNOW COVER MEASUREMENTS About April 1, 1938 Date	Avg. Snow Depth (In.)	Avg. Water Depth (In.)	AVERAGE WATER DEPTH (IN.) One Month ago (3-1-38)	One Year ago (4-1-37)	Two Years ago (4-1-36)
Blue Mountain Summit	141	6	12S	36E	5098	3-30	25.0	8.9	6.7	6.1	9.6
Dixie Springs	244	28	11S	34E	6000	3-30	82.0	28.0	-	22.4	24.9
Izee Summit	964	28	16S	29E	5293	3-31	26.6	8.8	6.7	7.5	10.5
Olive Lake	245	14	9S	33½E	6000	3-30	59.8	19.6	16.2	17.1	19.3
Starr Ridge	247	20	15S	31E	5193	3-29	15.4	5.0	3.3	4.4	4.4
DESCHUTES RIVER											
Caldwell Ranch	326	30	21S	8E	4400	4-1	40.5	15.8	-	13.2	-
Cascade Summit	321	7	23S	6E	5200	3-25	131.4	31.5	-	32.5	36.0
Charlton Lake	327	23	21S	6E	5750	4-1	102.9	34.4	-	30.7	-
Clear Lake	361	29	4S	9E	3500	4-1	47.4	16.7	-	18.3	16.3
Crescent Lake	325	11	24S	6E	4760	3-25	48.5	16.7	-	9.5	9.4
Derr	343	14	13S	23E	5670	3-27	43.0	13.4	-	14.7	-
Hogg Pass	351	24	13S	8E	4924	-	N.R.	N.R.	-	-	-
Marks Creek	344	25	12S	19E	4540	3-28	19.5	6.1	4.8	-	-
New Dutchman Flat	324A	21	18S	9E	6400	4-10	189.2	60.2	-	50.0*	53.1**
Ochoco Meadows	341	21	13S	20E	5200	3-29	46.5	14.7	10.0	15.0	12.6
Tamarack	342	8	15S	25E	4600	3-29	27.2	8.3	-	3.9	0.0
Three Creeks Meadows	331	13	17S	9E	6056	3-27	69.7	24.6	-	26.1	21.5
HOOD RIVER											
Brooks Meadows	431	2	2S	10E	4300	3-30	51.6	19.0	-	15.5	-
SANDY RIVER											
Still Creek	451	25	3S	8½E	3700	4-4	52.9	23.2	12.8	23.9	-
Phlox Point - Mt.Hood	452	6	3S	9E	5600	4-4	152.5	65.7	42.8	67.4	
CLACKAMAS RIVER											
Peavine Ridge	591	14	6S	7E	3500	4-2	62.3	23.7	13.0	25.2	-
Clackamas Lake	592	35	5S	8½E	3400	3-31	43.2	15.7	10.2	-	-

* - April 18 ** - April 29

TRIBUTARY BASINS (Primary & Secondary & Snow Courses)	Oregon Number	LOCATION Sec.	Twp.	Range	Elev.	SNOW COVER MEASUREMENTS About Date	April 1, 1938 Avg. Snow Depth (In.)	Avg. Water Depth (In.)	AVERAGE WATER DEPTH (IN.) One Month ago (3-1-38)	One Year ago (4-1-37)	Two Years ago (4-1-36)
WILLAMETTE RIVER											
Cascade Summit	321	7	23S	6E	5200	3-25	131.4	31.5	-	32.5	36.0
Charlton Lake	327	23	21S	6E	5750	3-31	102.9	34.4	-	30.7	-
Waldo Lake	521	8	21S	6E	5460	3-31	81.3	25.6	-	29.0	-
Waldo Lake	521A	15	21S	6E	5500	3-31	96.2	33.0	-	-	-
INTERIOR DRAINAGE											
HARNEY BASIN											
Fish Creek	965	4	33S	33E	7900	-	N.R.	N.R.	-	-	-
Idylwild Camp	961A	33	20S	31E	5200	3-31	18.5	7.7	6.1	5.8	8.9
Izee Summit	964	28	16S	29E	5293	3-31	26.6	8.8	6.7	7.5	10.5
Rock Spring	134	23	18S	32E	5100	3-31	18.0	8.9	5.5	3.9	9.1
Starr Ridge	247	20	15S	31E	5193	3-29	15.4	5.0	3.3	4.4	4.4
Silvies (Steens Mtn.)	963	35	32S	33E	6900	4-10	47.7	16.6	-	6.0*	15.4**
WARNER LAKE											
Burnt & Camas Creeks	911	12	39S	21E	6200	-	N.R.	N.R.	-	13.2	16.7
WEST COAST DRAINAGE											
UMPQUA RIVER											
Diamond Lake	743	29	27S	6E	5315	3-30	90.7	33.1	18.2	23.2	-
North Umpqua nr.Lake Creek	742	19	26S	6E	4215	3-30	55.0	19.7	-	14.1	-
Trap Creek	741	1	27S	4E	3800	3-28	68.4	23.3	-	16.6	-
Whaleback	7217	3	31S	2E	5140	3-28	153.2	45.4	-	42.0	-
Goolaway Gap	726	32	32S	3W	3000	3-31	26.2	10.0	-	6.3	-
Goolaway Mountain	7215	30	32S	3W	3730	3-31	59.0	24.0	-	14.3	-

* - May 7 ** - April 15

TRIBUTARY BASINS (Primary & Secondary & Snow Courses)	Oregon Number	LOCATION Sec.	Twp.	Range	Elev.	SNOW COVER MEASUREMENTS About April 1, 1938 Date	Avg. Snow Depth (In.)	Avg. Water Depth (In.)	AVERAGE WATER DEPTH (IN.) One Month ago (3-1-38)	One Year ago (4-1-37)	Two Years ago (4-1-36)
ROGUE RIVER											
Althouse	7216	17	41S	7W	4400	4-2	61.6	27.6	-	21.8	-
Annie Spring	831	19	31S	6E	6018	3-30	178.6	61.9	41.6	43.5	55.3
Big Red Mountain	729	33	40S	1W	6500	3-30	131.4	44.6	-	34.1	35.6
Billie Creek Divide	722	17	36S	5E	6000	3-31	81.2	26.4	18.4	26.6	38.3
Fish Lake	725	3	37S	4E	4865	3-30	60.6	19.0	11.6	16.1	18.7
Goolaway Gap	726	32	32S	3W	3000	3-31	26.2	10.0	-	6.3	-
Goolaway Mountain	7215	30	32S	3W	3730	3-31	59.0	24.0	-	14.3	-
Grayback Peak	727	9	40S	5W	6000	3-27	136.6	52.7	-	34.2	27.6
Hyatt Prairie Reservoir	723	15	39S	3E	4900	3-27	50.0	17.1	12.6	13.8	10.5
Little Red Mountain	7210	25	40S	2W	6500	3-30	105.5	37.4	-	27.1	27.4
Seven Lakes No. 1	7211	3	34S	5E	6800	4-1	186.7	72.0	-	61.1	80.8
Seven Lakes No. 2	7212	26	33S	5E	6200	4-1	147.9	49.3	-	49.9	57.8
Silver Burn	7219	30	30S	4E	3720	3-31	58.0	23.3	16.1	15.2	-
Siskiyou Summit	728	17	40S	2E	4630	3-27	43.1	15.5	11.3	11.5	1.9
South Fork Canal	7218	12	33S	3E	3500	3-31	22.2	7.4	6.8	0.0	-
Wagner Butte	7213	1	40S	1W	6800	3-28	74.3	21.6	16.7	21.3	19.1
Whaleback	7217	3	31S	2E	5140	3-28	153.2	45.4	-	42.0	-
KLAMATH LAKE BASIN											
Annie Spring	831	19	31S	6E	6018	3-30	178.6	61.9	41.6	43.5	55.3
Beatty 2/		22	36S	12E	4300	3-31	0.0	0.0	0.0	0.0	0.2
Billie Creek Divide	722	17	36S	5E	6000	3-31	81.2	26.4	18.4	26.6	38.3
Chemult No. 1	834	21	27S	8E	4760	4-1	49.6	18.7	12.5	8.0	-
Chemult No. 2 2/		21	27S	8E	4761	3-31	39.0	18.3	12.0	5.0	10.5
Chiloquin 2/		34	34S	7E	4187	3-31	4.2	1.5	4.4	0.0	0.3
Crystal 2/		26	34S	6E	4200	3-31	30.0	8.5	6.5	10.1	5.5

TRIBUTARY BASINS (Primary & Secondary & Snow Courses)	Oregon Number	LOCATION Sec.	Twp.	Range	Elev.	SNOW COVER MEASUREMENTS About April 1, 1938 Date	Avg. Snow Depth (In.)	Avg. Water Depth (In.)	AVERAGE WATER DEPTH (IN.) One Month ago (3-1-38)	One Year ago (4-1-37)	Two Years ago (4-1-36)
Fort Klamath 2/		22	33S	7½E	4150	3-31	16.0	6.5	8.6	4.0	0.2
Hyatt Prairie Reservoir	723	15	39S	3E	4900	3-27	50.0	17.1	12.6	13.8	10.5
Kirk 2/		1	33S	7E	4533	3-31	18.5	7.5	7.0	4.5	6.6
Lake of the Woods No. 1	835	11	37S	5E	4960	3-31	51.6	18.6	10.2	12.8	-
Lake of the Woods No. 2 2/		15	37S	5E	4960	3-31	62.0	19.8	-	13.5	12.0
Quartz Mountain 2/		33	37S	16E	5504	3-31	39.0	13.6	10.5	9.0	5.2
Pelican 2/		10	36S	6E	4200	3-31	17.0	5.5	4.0	1.5	0.4
Richardson Ranch 2/		22	35S	14E	4800	3-31	2.0	0.8	3.2	0.0	0.0
Rocky Point 2/		26	35S	6E	4150	3-31	12.5	3.6	4.2	2.6	0.4
Seven Lakes No. 1	7211	3	34S	5E	6800	4-1	186.7	72.0	-	61.1	80.8
Seven Lakes No. 2	7212	26	33S	5E	6200	4-1	147.9	49.3	-	49.9	57.8
Summer Rim	841	15	33S	16E	7200	4-1	57.2	20.6	15.2	14.4	16.7
Sun Mountain	836	22	32S	7½E	5350	3-31	113.4	39.7	-	26.2	-
Taylor Butte	842	16	33S	11E	5100	3-30	30.5	11.3	-	4.8	-
Yamsey 2/		19	30S	11E	4600	3-31	5.5	2.2	3.0	5.5	0.1
Strawberry	837	4	40S	16E	5600	-	N.R.	N.R.	8.8	-	-
GOOSE LAKE BASIN											
Quartz Mountain 2/		33	37S	16E	5504	3-31	39.0	13.6	10.5	9.0	5.2
Quartz Valley	811	34	37S	16E	5500	3-26	45.4	15.7	-	9.4	10.2
Strawberry	837	4	40S	16E	5600	-	N.R.	N.R.	8.8	-	-

Note: 2 / - Water content determined by melting a measured sample at stations maintained by The California Oregon Power Company.

agree in showing a greater water content than last year. At all elevations on all watersheds the soils are unfrozen and very wet, whereas last year snow fell on very dry watershed soils. This leads to the conclusion that even though snow cover in the Cascade and coastal mountains is only generally slightly better than last year, the stream run-off, because of the current wet soil condition, will on all streams be greater in varying degrees than last year.

The snow mantle in 1938 did not reach to such low elevations in the amounts it did last year and has now generally receded to above the 4,000 foot elevations. Unless unusual weather conditions prevail during the run-off season, especially high stream flow peaks during April and May are not to be expected.

Streams flowing into the Medford area generally should have a 20 percent greater flow during late summer than last year. Low flow of Rogue River at Gold Ray during the months of July, August and September should be 17 percent better than last year. Total flow at Gold Ray for the stream-flow year (October 1 - September 30) should be 20 percent better than last year. The flow of the North Fork of Rogue River, however, is expected to be very much better than last year. Last year the 12 months flow was 93 percent normal and this year it is expected to be 135 percent normal. Similarly, natural flow of Little Butte Creek for the 12 months ending September 30, 1938 is set at 140 percent normal. Low flow of the Applegate is forecasted at 20 percent better than last year. Farm soils in the Rogue River Valley are wet to greater depths than for many years and no immediate need for irrigation is noted. This will result in unusual delay in material withdrawals from storage reservoirs and considerable hold-over in Rogue Valley reservoirs is expected when the 1938 irrigation season ends. The following table shows the storage capacity, amount of water now in storage and forecasted peak storage for the four irrigation reservoirs of the Medford and Talent Irrigation Districts:

Reservoir	Storage Capacity (Acre Feet)	Now in Storage (Acre Feet)	Forecasted Peak (Acre Feet)
Four Mile	14,000	11,767	14,000
Fish Lake	7,720	4,683	7,720
Emigrant Gap	8,200	8,200	8,200
Hyatt Prairie	16,000	8,607	14,000*

*Could fill under exceptionally favorable run-off conditions.

The low flow of Evans and Graves Creeks, tributaries to the Rogue, and Cow Creek, tributary to the Umpqua, is expected to be about 15 percent better than last year. No attempt was made to forecast run-off for the Illinois River, because of incomplete information, but low flow will not be less than last year.

The net inflow into Upper Klamath Lake for the stream year October 1, 1937 - September 30, 1938, is set at 123 percent normal, or approximately 1,500,000 acre feet. Farm lands in the Klamath Basin are wet to depths of at least 8½ feet as contrasted with 3 or 4 feet during the average winter. There will be ample irrigation water supplies for this area during the coming season, as usual.

The run-off into Clear Lake reservoir for the stream-flow year 1937-38 may be greater than all previous records which date back to 1904-05 and will exceed the year 1906-07 when the run-off was 254,000 acre feet. The total run-off for 1937-38 is estimated at 270,000 acre feet, which is 270 percent normal. To Gerber reservoir for the stream-flow year ending September 30, 1938, inflow is set at 129,000 acre feet, or about 260 percent normal. Supplies available from these reservoirs will of course be much greater than the 1938 demand.

Drew Creek reservoir will easily fill and the forecasted supply when supplemented with the expected natural run-off will put a three year water supply in sight for the lands now served under this reservoir.

In the Lake County area soil moisture conditions in general are very good. While general farming is delayed because of heavy rains, spring grazing conditions will be much better than usual and dry land farming has excellent prospects. 3.7 inches precipitation was recorded at Silver Lake during December 1937. By the middle of February there was 40 inches of snow at Thompson Valley reservoir and this reservoir is expected nearly to fill, at least. By mid-February there was 32 inches of snow at Bear Flat and 26 inches of snow on Antelope Flat. The snow covering the territory between Sycan Marsh and Silver Creek Marsh ranged from 18 to 22 inches in depth. There is more water in Abert Lake than for many years and a sail boat can now be used on Goose Lake where one formerly drove a car. Hart Lake is nearly full and is sure to overflow for the first time since 1927. Summer Lake has reached the highest level recorded for many years.

Central Oregon

Studies of snow cover for the drainage area contributing to the Ochoco reservoir show snow water content to be about the same as last year but materially better than in 1936 at the same season. Ochoco reservoir now has in storage approximately 38,000 acre feet and will easily fill to capacity at 47,500 acre feet. Considerable overflow spilling is expected to take place this spring for the first time since 1921. The last year the reservoir filled was in 1928 but no spilling occurred that year. The soil on the watershed is not frozen and is very wet.

Snow water conditions at Three Creeks Meadows near the headwaters of Squaw Creek are about the same as last year but not quite as favorable as at this time in 1936. However, the soil is very wet under the snow cover this year whereas last year this was not the case. Consequently, it is expected that the McAllister and Plainview ditches may receive water for

about two weeks later than last year. An ample water supply is forecasted for the Squaw Creek Irrigation District. Unusually heavy snow drifting took place in the mountainous area near Sisters this past winter, resulting in heavy drift deposits in sheltered canyons. This should result in the low-water stream flow holding up unusually well for streams heading in this area. The low flow of the main Deschutes is expected to be about the same as last year, but judging from snow measurements at Cascade Summit, Crescent Lake and Chemult, the spring flow of the Little Deschutes should considerably exceed that of last year, thus providing good early season supplies to the Central Oregon Irrigation District ditches. Irrigation is expected to begin under this system by April 15.

Crane Prairie reservoir is now full to the capacity limited by agreement. Crescent Lake is expected to peak in storage this year at not less than 50,000 acre feet. This reservoir reached peak storage last year at 41,500 acre feet. If exceptionally favorable conditions prevail during the early run-off season Crescent Lake reservoir may peak in storage with an amount above 50,000 acre feet.

Soil moisture conditions prevailing in cultivated lands of the Deschutes basin are excellent, and even better than last year when conditions in some sections were very much better than for some years past. In some areas this is considered favorable to the delayed use of storage water. On cultivated lands near Prineville winter moisture has penetrated to approximately 54 inches. Penetration in farm lands at Madras is reported also at about 54 inches. At other locations near Madras rainfall penetration is reported as at least 30 to 36 inches. Average moisture penetration in Jefferson county grain lands was reported at 14 to 16 inches last spring and should be at least that this spring. Watershed soils near Suplee are reported saturated to a depth of 8 feet and similar conditions are reported for farm lands near Paulina.

Soils are still very wet and prospective grazing conditions on the high plateau near Brothers are expected to be the best for many years. Similar conditions are reported by the Ochoco Forest for grazing lands within the Forest, where grass made an excellent start last fall.

Eastern Oregon

Snow cover studies in the mountainous areas in Northern Nevada and southwestern Idaho from which the Owyhee reservoir draws its supplies, indicate a total run-off of 600,000 acre feet for the stream year ending September 30, 1938. Run-off at Watson for the four months period March-June, inclusive, is set at 310,000 acre feet, approximately the same as last year but only about 50 percent of that of the year before. The late summer flow is expected to be about the same as in 1937. Present total storage of 640,000 acre feet is less than that of last year at this time only because water is being spilled to provide storage space for spring inflow.

Warmsprings reservoir now holds 90,000 acre feet and should peak in storage at 150,000 acre feet, the greatest peak storage obtained since 1927. Agency Valley reservoir will fill. Winter precipitation penetration into cultivated lands near Ontario and Vale appears greater than in any spring during the past ten years. This is considered favorable to delayed heavy withdrawals from reservoirs although some early demands for newly seeded clover are expected. Water prospects on the Middle Fork of the Malheur River and on Calamity Creek area near Drewsey are about the same as on the rest of the Malheur River drainage, which would indicate an increase of approximately 25 percent above 1937 run-off.

Burnt River watershed snow cover is rather "spotty" but average total snow water content is approximately 30 percent greater than it was last year at this time. Watershed soil moisture conditions are certainly very much better than either 1936 ot 1937, as a result of above normal winter precipitation. Burnt River run-off during the three months period April, May and June will exceed that of the same period last year by at least 25 percent. If run-off conditions are exceptionally favorable, the run-off may exceed that of last year by 40 percent or more. Storage water reached the elevation of the spillway lip of the newly completed Unity reservoir several days ago, but probably will not be pushed higher this year.

Soil moisture conditions are excellent is both the Malheur and Whitman Forests. Forage grasses with a good start last fall have come through the winter in good shape, and prospects are excellent for early forage.

Snow water contents on the watershed at the headwaters of the South and Middle Forks of the John Day River are approximately 25 percent better than last year. Even though heavy winter rains have resulted in watershed soil moisture reaching a more favorable point than usual, it is not believed that this will necessarily increase the low water flow of these two forks of the John Day River. It is because of the superior snow water storage condition that the flow of these forks of the John Day River should total at least 20 percent better than last year for the period April 1 -September 30. Conditions are slightly less favorable on the North Fork of the John Day, where winter precipitation was less than elsewhere on the watershed and accumulated water in the form of snow is actually less than it was last year at this time. The lower tributaries of the John Day, even under the most favorable conditions affecting run-off, while probably slightly better than last year, are expected to provide an insufficient low water flow.

In the Harney Basin snow on the ground on the Silvies River and Silver Creek watersheds contains nearly 50 percent more water on the average than at this time last year, but holds slightly less total water than on April 1, 1936. Much snow remains at fairly low elevations and watershed soils are unusually wet and are unfrozen.

The sloughs and channels on both the east and west forks of Silvies River are filled with water to the lower end of the valley. Much land in the Lawen area and Island Ranch vicinity is covered with water and some lands in the Burns area have been covered. Silver Creek will shortly be overflowing into Harney Lake.

Trout Creek had a total run-off of approximately 7,000 acre feet in both 1937 and 1936 and is conservatively expected to run at least twice that much during the coming year and, with exceptionally favorable conditions, it might deliver as much as 20,000 acre feet. The west side of Steens Mountain and the east slope of Hart Mountain are covered with snow down to the valley floor. While the streams feeding Catlow Valley have shown only a small run-off so far, they can be expected to deliver a big supply of water before the irrigation season is over. Donner and Blitzen River flow has been steady this spring to date, but this flow has been contributed largely from precipitation or snow on the lower hills and upper valley lands. The snow at the higher elevations is practically untouched, and a large quantity of water is still stored there as snow. Over the whole Harney County area the soil is now practically saturated and the prospect for range grass is excellent.

Northeastern Oregon

Studies of snow cover on the watersheds from which the Baker and LaGrande valleys draw their supplies indicates that the snow is unusually "spotty" this year, but above elevations of 6,000 feet snow depth and water content are generally consistent in showing water percentages only about 12 percent less than last year. Spring melting has not yet started above this level. Below elevations of 6,000 feet snow cover in some areas appears to be less than usual, especially on exposed slopes.

All streams discharging into the Baker - LaGrande area have carried far more water during the past winter than usual because of above normal precipitation and general open-winter conditions. Eastern Oregon Light and Power Company records at Fremont, Morgan Lake and Cove show a precipitation only one-fifth greater for the October-March period than the average for the past 11 years. Since snow measurements near Anthony Lakes and Summit Springs show water content less than last year, and even though watershed soils are now very wet, it seems doubtful if low flow of the Powder and Grande Ronde and their tributaries in this area, will more than very slightly exceed that of last year. Of course, if May and June rains occur as they did last year, prospects for late summer water will be improved.

Over in the Wallowa Mountains snow depths are greater than for many years, and the Aneroid Lake snow course shows greater water content than in any year since 1929, the year this course was established. There are now in Wallowa Lake approximately 16,500 acre feet of water. Under favorable spring melting conditions Wallowa Lake should fill. In this event it will be the first time the reservoir has completely filled since the height of the dam was increased in 1929. Snow measurements across the summit near the

Cornucopia Mine show a water content of 40 inches which is very similar to that near Wallowa Lake. Prospects for late irrigation water supplies appear to be very good for lands in the Eagle Creek and Pine Creek Valleys.

Moisture penetration in soils in the Baker Valley is greater this spring than at any similar time during the past ten years at least. The penetrating soil moisture is reported as connecting with the water-table at Union. Prospects for winter wheat crops are excellent because of favorable soil moisture conditions, but of course the present soil moisture supplies will be exhausted unless renewed in most cropped lands before late summer.

In all parts of the Whitman National Forest prospects for early spring forage are excellent.

Umatilla - Walla Walla Basin

Prospects for good to fair late summer irrigation supplies are not as bright in some parts of this area as elsewhere in the State, although storage supplies are expected to be very good.

With the exception of the South Walla Walla River, forecasted flow for the six months period ending September 30, 1938 will be considerably less than last year, but on the Walla Walla River flow is expected to be the same. The Umatilla River at Pendleton is expected to be 30 percent less, McKay Creek 49 percent less and Butter Creek 39 percent less. On all of these streams, with the exception of Butter Creek, the total flow for the stream year however, will be greater than for the stream year 1936-37. The stream year covers the period October 1 to September 30. This increased total flow as contrasted with reduced flow for the next six months is accounted for in the heavy winter flow of all streams. Because of this unusually heavy winter run-off, McKay reservoir had 60,000 acre feet in storage on April 11. McKay should peak in storage at not less than 68,000 acre feet, 93 percent of capacity, and with favorable run-off conditions, may even fill. If the reservoir fills, it will be for the first time since 1933. Cold Springs reservoir is now full.

Tabulated stream flow forecasts follow:

	Run-off in Acre Feet	
	Stream Year 1937-38	Next Six Months Apr.1 - Sept.30
South Walla Walla River	120,000	65,000
Umatilla River at Gibbon	135,000	63,000
Umatilla River at Pendleton	334,000	150,000
McKay Creek	56,010	18,000
Butter Creek	12,000	6,000

Soil moisture data from the Branch Experiment Stations at Hermiston, Pendleton and Moro indicate excellent winter wheat prospects. Rainfall penetration at the Hermiston Station on unirrigated lands is approximately 48 inches as compared with 16 inches last year at this time. On the irrigated alfalfa lands about twice as much water is held in the upper four feet of soil as last year. Even so, some early irrigation is underway or soon will be started on the lighter soils. Loss of soil moisture has exceeded replenishment from rain during the past 40 days, but rate of withdrawal of soil moisture this spring to date is considered about normal. At the Moro and Pendleton Field Stations fallow lands are wetted to depths of 5 to 6 feet, much better than usual. Last year at the Pendleton Station penetration was only 24 inches at this season. Penetration in stubble lands at Moro is now about 48 inches.